

GuideView: Structured Multi-modal Delivery of Clinical Guidelines

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Abstract

GuideView is a system designed for structured, multi-modal delivery of clinical guidelines. Clinical instructions are presented simultaneously in voice, text, pictures or video or animations. Users navigate using mouse-clicks and voice commands. An evaluation study performed at a medical simulation laboratory found that voice and video instructions were rated highly.

Introduction

The need for medical care often arises in settings where medical expertise is not immediately available. During space exploration astronauts (who typically receive approximately 40 hours of medical training) may not have a physician available on hand when a medical need arises. In rural areas of developing countries, physician availability is also typically low.

GuideView

In *GuideView*, designed to assist in providing medical care in settings such as the above, clinical guidelines are structured into process steps, and presented using text, voice, still pictures, video, or animation, simultaneously. Each mode compliments the other, resulting in a rich content delivery environment. At each step, users navigate to the next by selecting from a small number of choices using mouse-clicks and/or spoken commands. The latter enables caregivers to use both hands to assist patients and still interact fully with *GuideView*.

GuideView is compatible with multiple platforms including the Internet, stand-alone Windows computers, and PocketPC-based PDAs. Voice commands (not available for PocketPC) were implemented using off-the-shelf software/hardware.

Methods

A user evaluation study was performed in the Medical Simulation Laboratory at Wyle Laboratories, Houston, TX. Ten subjects with some medical training (first aid; two had received training as paramedics) participated. *GuideView* was executed stand-alone on a laptop computer equipped with speakers and microphone headset. Patients were simulated using mannequins, including a Human Patient Simulator® (METI) which presented palpable pulse, breathing, and chest movement. Subjects followed scripts for two medical scenarios and



performed several procedures including rescue breaths, taking pulse, inserting ILMA (Intubating Laryngeal Mask Airway) and Heimlich Maneuver. Each subject performed one scenario solely with mouse-clicks and the other solely using voice commands. Subjects then answered a questionnaire that included the NASA Task Load Index, a 6-component measure of workload [1]

Summary of Results

Some results found were that voice advice was rated “Indispensable” by 60% and “Useful” or better by 40%. Text and still pictures were rated “Very Useful” by 50%. Video output was rated “Indispensable” by 30% and “useful” or better by 50%. Voice commands caused a significant (paired t-test, $p < 0.004$) increase in overall workload. This can be attributed to oversensitivity of the microphone.

Conclusions and Future Work

GuideView shows considerable promise. Study results will be used to improve the system, especially the voice command feature.

References

1. Hart S, Staveland L. Development of NASA TLX (Task Load Index). Human Mental Workload (Hancock, Meshkati Eds), pp 139-183. Elsevier 1988